EDITORIAL COMMENT

This department of California and Western Medicine presents editorial comment by contributing members on items of medical progress, science and practice, and on topics from recent medical books or journals. An invitation is extended to every member of the California and Nevada Medical Associations to submit brief editorial discussions suitable for publication in this department. No presentation should be over five hundred words in length.

I

The Growing Complexities of Serum-Therapeutic Logic.*—Were a professional immunologist to attempt to epitomize the clinical meaning of the newer theories of serology, he could not do better than select a single typical example. Few examples would be better fitted to this purpose than the classical attempts to prepare a clinically useful antipoliomyelitis serum by the injection of spinal-cord emulsions of experimentally infected monkeys into horses. Twenty years ago the qualitative success of this technical method was axiomatic. To the newer dynamic serology and microbiology, however, this axiom is replaced by a pyramid of a dozen basic hypotheses. An appreciable error in any one of these hypotheses would vitiate the hoped-for therapeutic success. Among these hypotheses now substituted for the classical intuition are:

(*a*) The assumption that human poliomyelitis is a specific infectious disease, caused by a qualitatively invariable extraneous infectious agent, and is not a mere symptom complex of multiple extrinsic or intrinsic etiology. (Quantitative variations in this hypothetical unit virus, such as increases or decreases in its specific virulence, would, of course, not vitiate the classical logic.)

(*b*) The assumption that human convalescent immunity to this disease is specific, that the sole or essential factor in this acquired immunity is the formation or liberation of specific humoral antibodies. (An essentiallly nonhumoral or specific cellular immunity has been recently alleged for certain other infectious diseases.)

(*c*) The assumption that this hypothetical unit virus is not "transformed" or does not "mutate" into a new biochemical specificity on injection into monkeys. (Such qualitative adaptations of microbic specificity have been recently alleged for certain other infectious agents.)

(*d*) The assumption that the subcutaneous or intravenous "specificity differential" between the antirhesus phase of this virus and the tissues of the horse, is qualitatively identical with its original antihuman "specificity differential" in man. (Horse immunity and human immunity are known to be directed against different chemical factors in certain antigens, the horse antiserums being deficient in certain antibody factors presumably essential for man.)

(*e*) The assumption that the rhesus spinal cord does not contain "heterophile" or fractional human specificities in sufficient quantities to stimulate the production of antihuman endotheliotoxins or neurotoxins in the horse. (Such accessory cytotoxins against certain animal species are known to be produced when certain antigens are injected into certain other animal species.)

(*f*) The assumption that the horse antibodies injected into man would not function as specific growth stimulants for the already present poliomyelitis virus nor produce a clinically dangerous specific immunological negative phase. (That certain presumably immune serums act as specific growth stimulants for the corresponding bacteria is one of the recent surprises of theoretical immunology. The precipitous lowering of specific resistance is a recently recognized contraindicant for certain proposed methods of specific vaccine therapy.)

To which must be added (*g*) the classical hope that the horse antibodies can be produced in sufficiently high titer for clinical use and that, injected into man, these alien humoral defenses are not denatured, bound or otherwise inactivated with sufficient rapidity to prevent their hoped-for therapeutic value.

Research serologists today are frankly and courageously facing a score of such hitherto ignored biological complexities, with numerous newly plausible explanations of previous clinical nonsuccess, and renewed hope of ultimate therapeutic victory.

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(To be continued)

Encephalography.—Encephalography not only aids in the diagnosis of obscure brain lesions, but is also of definite therapeutic value in certain neurological diseases. Encephalography is the x-ray visualization of the cerebral subarachnoid spaces and the cerebral ventricles by means of the fractional removal of cerebrospinal fluid by cisternal or lumbar puncture with a fraction insufflation of air.

The encephalogram reveals the size of the ventricles, whether they are dilated, as in hydrocephalus; contracted, distorted or pushed to one side of the brain, as in tumor; or whether they are of normal size and position. The third ventricle, the aqueduct of Sylvius, and the fourth ventricle are outlined. Any obstructions in these areas, or failure to fill can be readily interpreted. Abnormalities in the subarachnoid space are visualized, such as arachnitis—referring to adhesions of the arachnoid—with a resultant absence of air over the cortex, or extensive pockets of air as occurring in so-called cortical atrophy, or changes in position of the head on x-ray film.

* This is the first of a series of three papers.

Encephalography must be differentiated from ventriculography, which is the visualization of the ventricles only, and is carried out by direct ventricular puncture. Each of these procedures has its use in the diagnosis of brain lesions. Encephalography is contraindicated in brain tumor suspects wherein the spinal manometric pressure is above 20 millimeters of mercury (taken in the horizontal position), or in patients giving clinical signs of posterior fossa lesions. In these cases we fear the possibility of the medulla jamming into the foramen magnum, which results in respiratory failure and death.

During the procedure of encephalography some of the patients perspire freely, variation of blood pressure and pulse occur; they infrequently collapse, and rarely have convulsions, though headaches, nausea and vomiting usually occur. The cell count of the spinal fluid is increased and the patient is ill for approximately twenty-four hours. The mortality in a series of 325 cases reported by Grant was one patient. In fifty cases under the author's observation, there was no death. This is in contrast to ventriculography, which carries a mortality of 5 to 10 per cent. However, it must be remembered encephalography is performed in the less seriously ill patients.

When unusual neurological symptoms exist, encephalography aids by establishing an organic diagnosis. The presence of surgical lesions is verified, such as tumor, cysts, etc., and may be accurately differentiated from nonsurgical cerebral lesions.

Convulsive states which arise from mass lesions, infections or trauma, or from causes unknown, are segregated by means of the encephalogram into surgical and nonsurgical types. As we all know, convulsive seizures are frequently the first signs of brain tumor, and it is for this reason that encephalography should be considered in all cases of early epilepsy. Various abnormalities of the ventricular system or subarachnoid spaces are demonstrated in certain cases of idiopathic epilepsy, as well as the traumatic type. In cases of epilepsy of the idiopathic and traumatic type, encephalography frequently decreases the number of convulsions, and in some patients even stops convulsions for a period of time. Though this method cannot be recommended as a cure for epilepsy, or even a relief, it is interesting to note that such improvements do occur.

Following head injuries and with the development of the post-traumatic sequelae such as headache, dizziness, etc., abnormalities of the ventricular system and the subarachnoid channels are often visualized by encephalography. Not only is the encephalogram of value for diagnostic purposes in such cases, but it frequently relieves the severe post-traumatic headaches. It is unfortunate this procedure is not used more widely as a therapeutic adjunct for these troublesome head pains.

Bingel, Liebermeister, Holtz, Siegle and Sollgruber, Heymann and Hamburger reported some success in the treatment of meningitis. Guttmann and Kirschbaum, as well as Ebaugh, stated that in tabes and progressive paralysis the prognosis and results of malarial treatment may be determined by an encephalogram.

In cases of spastic paraplegia and retarded mentality due, apparently, to birth trauma or defective development, encephalography is of value in arriving at an accurate anatomic diagnosis and prognosticating, to some degree, the future of the child—whether intensive training is justified or whether surgical intervention is indicated. The conventional diagnosis of feeble-mindedness, epilepsy and cerebral palsy do not define the anatomic or physiological defects. However, one must not entirely rely upon the encephalographic diagnosis, or prognosticate decisions on the basis of encephalograms alone.

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International Association for Prevention of Blindness. Progress achieved during the past year in the world-wide movement for conservation of vision, particularly in the effort to guard the eyesight of school children, was described in New York City by delegates from England, France, Germany, Switzerland, and the United States at the third annual meeting of the International Association for Prevention of Blindness.

The United States was represented by Mrs. Winifred Hathaway of New York City. . . . Addressing the convention on the topic, "The History and Development of Sight-Saving Classes in the United States," Mrs. Hathaway said: "Into the foundation of any great building, whether it be an actual architectural structure, a progressive movement, or a cause, are woven the thoughts and ideals of thinkers living in advance of their times. Those in the United States interested in the development of special educational advantages for partially seeing children are ever mindful of the fact that, away back in 1802, Franz Von Gaheis of Austria was the first to recognize that partially seeing children were quite as much misfits in schools for the blind as in schools for the normally seeing.

"It was not until 1908, however, that James Kerr and Bishop Harmon in London brought about the establishment of the first special classes for myopes. The city of Strasbourg, then in Germany, established classes in 1909. It was from these myope schools that the United States received its direct inspiration.

"On a visit to England in 1909, Edward E. Allen, superintendent of the Perkins Institution for the Blind in Boston, learned of the myope schools recently established. . . . It took considerable time to convince educational authorities in the United States that special opportunities were necessary for partially seeing children, but due chiefly to Mr. Allen's efforts, a class was established in Boston in April, 1913. In September of that year, due to the efforts of Mr. Robert B. Irwin, a second class was established in Cleveland. From these two classes have developed the 409 sight-saving classes in the United States today. They are maintained by 118 cities in 22 states. These classes are now so generally accepted as a part of the educational system that the period of fundamental experiment may be said to be of the past.

"In the United States the most conservative estimate of the proportion of children requiring the advantages of a sight-saving class is one in a thousand of the school population. However, in those states and cities that have most fully developed this type of education, the proportion more nearly approximates one in five hundred of the school population. At least five thousand sight-saving classes are needed to provide proper educational facilities for all the visually handicapped school children in the United States. . . ."